

REMARKS

The Office Action noted that dependent Claim 25 and 26 are allowable if rewritten in independent form.

Claim 25 set forth the relative positioning of the front and back substrates after an applying state for the sealing material and before a bonding step of the substrate. As such, the front and back substrates are separated sufficiently to allow contaminant gases to escape during a baking step of both the front and back substrates while during a subsequent bonding step the sealing material is softened and is permitted to bond the front and back substrates together.

The Office Action apparently recognized that the principally cited *Narayanan et al.* reference is directed to forming sealing bars that are tacked in place, supplemented with a glass frit slurry placed between the sealing bars and hermetically sealed in a non-reactive gas environment see Col. 3, lines 42-62. However, on page 11, Paragraph 8, the Office Action indicated that the independent claims such as Claim 1 did not expressly claim any order or succession of the assembling step nor of the baking steps of the deposited phosphor layer for removing contaminants.

Accordingly, Applicant has addressed the issues raised by the Office Action by amending Claims 1 and 16 without raising new issues and consistent with the indicated allowable subject matter and submits that the application should now be in condition for allowance.

Claim 1 has been amended to clearly define that a stacking step, where the front and back surfaces directly face each other in a stacking arrangement after there has already been a pre-baking of the phosphorous layer and an application of a sealing material to a peripheral region of one of either the front or back substrates. Additionally, the baking step heats the front and back

substrates for specifically burning out organic binder in the presence of an oxygen dry gas to an internal space formed between the spaced front and back substrates in the stacked arrangement.

Claim 16 likewise defines a method where the baking step for burning out the organic binder again is performed after the pre-baking phosphorous layer forming step and the sealing material applying step. Again, the surfaces of the front and back substrates are positioned to face each other and separated from each other to provide enough space to allow gases to escape from the internal space between the faces of the substrates to the outside of the substrates and a subsequent bonding step where the front and back substrates contact the sealing material for bonding by keeping the front and back substrates at a temperature higher than the softening point of the sealing material.

Thus, Claims 1 and 16 and the dependent claims therefrom more than adequately distinguished over the *Narayanan et al.* (U.S. Patent No. 6,113,450) either alone or in combination with secondary references. Thus, the present claims not only call for the preliminary pre-baking phosphorous layer on the surfaces of one of the front and back substrate but further clearly define that they are positioned to face each other and that a second baking step occurs while the front and back substrates are disposed in a position facing each other with an internal space that permits the release of contaminants. Additionally the *Narayanan et al.* reference does not suggest the insertion of dry gas with oxygen, but rather suggests in Paragraph 9, Lines 62-64,

In one embodiment, heating is performed in an inert gas environment (e.g., Nitrogen) to maximize oxidation.

Thus, *Narayanan* does not address the issues of baking phosphorous while the front and back substrates are disposed to face each other and are spaced so that gases, water and the like can be released along with the burning gases generated.

The present invention uses a relatively low, partial pressure of water vapor dry air, which is particularly effective to prevent the deterioration of blue phosphorous. The Office Action further cited Figure 1C, Step 194, of the *Narayanan et al.* reference for a pre-heating of a phosphorous layer. Actually, Figure 1C is directed to forming a frame using an extruded seal material so that when glass frit is heated in a frame shape, the binding material from the glass frit is released and not the substrate or the phosphorous layer. It should be noted that the heating, for example, through a laser, is not addressing the issue of a pre-baking of the phosphorous layer.

This is consistent with the specific purposes and teaching of the *Narayanan* references as set forth in Column 3, Lines 42-48, as follows:

The present invention provides a method for forming seal material bars using an extrusion process. Also disclosed are methods for forming a thin flat panel display using seal material bars and seal material frames. In addition, seal material frames and methods for forming seal material frames that form a good hermetic seal between a faceplate and a backplate are disclosed.

In summary, the *Narayanan et al.* reference is directed to a specific improvement in sealing flat panel displays, and more particularly, a method and apparatus of providing seal material bars formed of a glass frit with an organic compound that are extruded and cut to shape. The heating step disclosed is to remove the organic compound from the seal material bar. While it is understood that the Office Action was taking a broad view of this teaching relative to the claims, it is believed that the amendment of Claims 1 and 16 clearly defines that such a teaching in *Narayanan et al.* is not properly applied to our present claims. Attempts to take simply

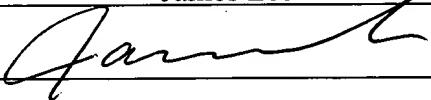
heating steps as applied to the glass frit bars is not an adequate teaching of the specific steps presently defined by our claims.

The Office Action finally cited the *Aoki et al.* (U.S. Patent No. 6,369,501) simply to teach a phosphorous concentrating a blue phosphorous layer. It does not address the deficiencies of the *Narayanan et al.* reference.

Applicant accordingly believes that the case is now in condition for an allowance, and an early notification of the same is requested. If the Examiner believes that a telephone interview will help assist, he is respectfully requested to contact the undersigned attorney at the listed telephone number.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on August 19, 2003.

By: \_\_\_\_\_ James Lee



Signature

Dated: August 19, 2003

Very truly yours,

**SNELL & WILMER L.L.P.**



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